SEP 15 1981

546-D

GA1.13:CED-81-152

BY THE U.S. GENERAL ACCOUNTING OFFICE

Report To The Interagency Regulatory Liaison Group

COMPLETED

Grain Fumigation: A Multifaceted Issue Needing Coordinated Attention

Grain fumigation is a broad issue which affects the efficiency with which grain moves through the marketing system and involves environmental, consumer and worker protection, transportation, and food considerations. Despite many years of using fumigants as a means to rid grain and grain products of insect pests, and despite the involvement of many governmental agencies in various facets of this activity, workers continue to be exposed to potentially unsafe fumigant levels, fumigant residue has been found in some food products, and a need exists for more knowledge concerning fumigants and their effects. To help resolve these and other problems, a more integrated, coordinated approach is needed.

GAO believes the Interagency Regulatory Liaison Group, formed in 1977 to allow participating agencies to work closely together on topics that cross agency lines, is a proper forum to oversee Federal involvement in the grain fumigation area and to bring agencies together in solving problems and obtaining information. GAO is recommending that the group adopt grain fumigation as a topic for its consideration and that it address the issues discussed in this report.

CED-81-152
SEPTEMBER 10, 1981

I

Request for copies of GAO reports should be sent to:

U.S. General Accounting Office
Document Handling and Information
Services Facility
P.O. Box 6015
Gaithersburg, Md. 20760

Telephone (202) 275-6241

The first five copies of individual reports are free of charge. Additional copies of bound audit reports are $3.25 each. Additional copies of unbound report (i.e., letter reports) and most other publications are $1.00 each. There will be a 25% discount on all orders for 100 or more copies mailed to a single address. Sales orders must be prepaid on a cash, check, or money order basis. Check should be made out to the "Superintendent of Documents".

UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

COMMUNITY AND ECONOMIC
DEVELOPMENT DIVISION

B-204571

The Honorable Thorne G. Auchter
Assistant Secretary for Labor
Occupational Safety and Health
Administration

The Honorable Anne M. Gorsuch
Administrator
Environmental Protection Agency

The Honorable Arthur Hull Hayes, Jr.
Commissioner of Food and Drugs
Food and Drug Administration

The Honorable C. W. McMillan
Assistant Secretary for Marketing
and Inspection Services
Department of Agriculture

The Honorable Nancy H. Steorts
Chairman, Consumer Product
Safety Commission

As members of the Interagency Regulatory Liaison Group, we believe you will have an interest in this report which summarizes a limited review we undertook on grain fumigation. The report identifies a number of fumigant-related problems and discusses the Federal Government's fragmented involvement in this area. The report contains several recommendations to the Interagency Regulatory Liaison Group which we believe will result in a more integrated, coordinated approach to solving problems and obtaining needed information in the grain fumigation area.

As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on actions taken on our recommendations to the Senate Committee on Governmental Affairs and the House Committee on Government Operations not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report. In this instance, rather than individual agency responses to our recommendations, one consensus statement signed by each Interagency Regulatory Liaison Group member would be a preferable method of complying with the requirements of section 236.

III

We are sending copies of this report to the Director, Office of Management and Budget; appropriate congressional committees and subcommittees; and others we contacted during our review.

Henry Eschwege

Henry Eschwege
Director

GENERAL ACCOUNTING OFFICE
REPORT TO THE INTERAGENCY
REGULATORY LIAISON GROUP

GRAIN FUMIGATION: A MULTI-FACETED ISSUE NEEDING COORDINATED ATTENTION

D I G E S T

Grain fumigation is a broad subject, influencing the efficiency of grain marketing and encompassing environmental, consumer and worker protection, transportation, and food issues. Despite many years of using fumigants to eradicate insect pests from grain and grain products, and despite the involvement of many government agencies in various facets of this activity, fumigant problems remain and much still needs to be learned about fumigants and their effects. Many of the problems and questions about fumigants arise because they are toxic substances and can harm not only insects but humans as well. GAO's work disclosed that:

--Grain workers are exposed to potentially unsafe fumigant levels because (1) shipments of fumigated grain are frequently not placarded with information that both warns and informs, (2) fumigants are not always properly applied, and (3) workers are not always sufficiently trained and/or equipped to work around fumigants, nor do they always have sufficient appreciation for fumigant dangers. (See pp. 4 to 9.)

--Workers' concerns about health as a result of fumigant exposure have strained relations between some company and union officials and among other parties involved in shipping, handling, and storing grain. (See pp. 9 and 10.)

--Potentially harmful fumigant residue has been found in some food products. (See pp. 10 and 11.)

--A need exists for more knowledge about fumigants and their effects to either reduce current unwarranted anxiety levels or result in documented support for stronger, future precautionary measures. (See pp. 11 to 13.)

Currently, many parties are involved with grain fumigation in some way. The Federal approach to the subject is fragmented; each agency often

Tear Sheet

CED-81-152
SEPTEMBER 10, 1981

V

works independently without any one agency having a good overview of all that is going on. As a result, work may be duplicated among agencies and lines of responsibility are not always clear.

Officials from the Environmental Protection Agency told GAO that a need exists for the different agencies to get together through some kind of forum and begin to study grain fumigation from an integrated, coordinated approach. Two other sources suggested the Interagency Regulatory Liaison Group as a forum that could provide this kind of approach. One source, a Department of Agriculture official, indicated that the group's involvement is needed because of the multiagency jurisdictional nature of fumigant use and grain handling. The other source, an official from the State of Wisconsin, pointed to the inability of various agencies to individually reduce the number of grain shipments in one area that are made with unacceptable fumigant levels. This source was hopeful that the group could sort out responsibilities and aid in finding an efficient and effective solution to the problem. (See pp. 14 to 16.)

Each agency involved in the various aspects of grain fumigation appears to have a role to play, and GAO did note some interaction among various agencies. But overall, GAO believes that fumigant-related problems that continue to exist indicate the need for a more integrated, coordinated approach.

GAO believes that the Interagency Regulatory Liaison Group, established to allow participating agencies to work closely together on topics that cross agency lines, is a proper forum that could bring various agencies together and provide the overseer role that is needed. It could help reduce any overlap or duplication that may now exist by objectively defining agency lines of responsibility. It could help ensure that the efforts of one agency fit with the efforts of others. It could establish subgroups to study various facets of the fumigant issue, drawing upon, and combining, the unique talents and expertise from the agencies that are involved in solving the problems at hand or in obtaining and sharing the knowledge that is needed if fumigants are to be used in the future most efficiently, effectively, and safely. (See p. 16.)

RECOMMENDATIONS

GAO recommends that the Interagency Regulatory Liaison Group accept grain fumigation as a topic for its consideration. GAO recommends that the group assume the role of overseer of the fumigation area and that it publicize this role to its participating agencies and others. GAO further recommends that the group address the problems discussed in this report and any related issues. Initially, the group may want to deal only with problems and issues faced by its member agencies. But thereafter the group could look for ways to involve other agencies that are not now a part of the group, but which do deal with some facet of grain fumigation. (See pp. 16 and 17.)

Tear Sheet

Contents

		Page
DIGEST		i
CHAPTER		
1	INTRODUCTION	1
	Objectives, scope, and methodology	3
2	GRAIN FUMIGATION PROBLEMS AND UNANSWERED QUESTIONS REMAIN	4
	Grain workers are exposed to high fumigant levels	4
	Shipments of grain are frequently not placarded	5
	Improper fumigant applications	7
	Need for more training, better equipment, and greater worker appreciation for fumigant hazards	8
	Strained relations between company and union officials	9
	Fumigant residue found in food products	10
	Lack of knowledge concerning grain fumigants and their effects	11
	Additional fumigant-related issues affecting the future and/or needing resolution	13
3	NEED FOR INTEGRATED APPROACH TO SOLVE GRAIN FUMIGANT PROBLEMS	14
	Numerous Federal agencies involved in grain fumigation	14
	IRLG suggested as an entity to oversee grain fumigant problems	15
	Conclusions	16
	Recommendations	16

ABBREVIATIONS

AFL-CIO	American Federation of Labor - Congress of Industrial Organizations
DOT	Department of Transportation
EPA	Environmental Protection Agency
FDA	Food and Drug Administration
FGIS	Federal Grain Inspection Service

FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
GAO	General Accounting Office
IRLG	Interagency Regulatory Liaison Group
OSHA	Occupational Safety and Health Administration
USDA	U.S. Department of Agriculture

CHAPTER 1

INTRODUCTION

The United States is one of the world's most important grain producers. Corn and wheat, two principal grains, rank among the country's top agricultural exports each year. Quantities of grain thus produced and exported are measured in millions of metric tons and billions of bushels and are valued in the billions of dollars.

The value of a quantity of grain depends to a large extent on its quality and, therefore, steps must be taken to preserve quality and prevent economic as well as nutritional damage. Insect infestation is one such means by which grain is damaged and its quality lessened. A wide variety of insects damage grain directly by feeding on the kernels and indirectly by contaminating the grain with their waste, cast skins, webbing, and body parts. Low levels of insect infestation in farm-stored grain can develop into damaging populations in short order. One grain beetle, the Khapra, is said to be a terror to the grain industry because of the speed with which it can destroy grain and reproduce itself. It is said this beetle can reduce a 40-pound grain sack to 10 pounds in 3 months and that about all that is left are the beetles themselves.

Maintaining grain quality is important to the United States' position in world markets, farmer income, and consumer costs. In the United States, the major responsibility for quality rests with the owner of the grain and changes as many times as ownership changes. Quality is monitored because of economic incentives for high-quality grain and the financial penalties that result if quality is not maintained.

Temperature, moisture, and grain dockage or dust are conditions that interact and encourage insect infestation. Much can be done to minimize this interaction if harvesting is done when the grain's moisture content is right and with equipment properly adjusted to prevent broken kernels and dockage, if all equipment and storage bins are kept clean, through proper aeration during storage, and through a regular monitoring routine. These measures are not always foolproof or possible, however, and other measures, involving the use of chemicals, sometimes become necessary to control insect infestation. Two general types of chemical control are used:

--Insect protectants, such as malathion, are applied to uninfested grain as it goes into storage to prevent insect infestation for a period of from 6 to 12 months. After this period it may need to be applied again or a fumigant used.

--Fumigants are used to kill insect infestations already present in grain. If properly applied, fumigants are

effective in destroying all stages of insect development. A fumigant's period of action is short, usually just a few days. Fumigants do not prevent later reinfestation.

Insect protectants are relatively safe, requiring only normal precaution to prevent spray contact with the skin and inhalation of spray particles. Fumigant chemicals, on the other hand, are highly toxic and can be hazardous to use. Many are classified as "restricted" pesticides, and special training and certification are required before these materials can be purchased or applied.

Fumigants, accounting for the bulk of the discussion in this report, have been considered for around 50 years as an effective, practical, and quick method of eradicating insect pests in stored grain and grain products. They are available in gas, liquid, or solid forms but to be effective all must convert to gaseous form after application. Generally, the gas concentration must be maintained in an airtight enclosure for from 1 to 5 days; thereafter the enclosure is ventilated and the gaseous vapors are allowed to dissipate.

Although there is little published data on the use of specific fumigants, the Environmental Protection Agency (EPA) estimated that the total usage of liquid products in 1977 was about 3 million gallons and usage of gaseous or solid products was about 452,000 pounds. EPA estimated that 98 percent of the liquid products was used on stored grain and 2 percent was used for spot fumigation in flour mills. For gaseous/solid products, 73 percent was used on stored grain; the remaining 27 percent was applied in food manufacturing industries. Carbon tetrachloride, carbon disulfide, ethylene dibromide, aluminum phosphide, and methyl bromide are among the chemicals found in many of the fumigant products on the market today.

Not all grain that is produced is fumigated. In fact, the amount that is represents a small fraction of the whole. Although there is little concrete data, a research proposal put together by the University of Minnesota estimated that Minnesota farmers treated about 5 percent of their corn, 10 percent of their wheat, 2 percent of their oats, and 20 percent of their barley with carbon tetrachloride-based fumigant formulations. This may or may not be indicative of other parts of the country. Because of reinfestation during storage or as it is moved and/or mixed with grain from other sources, some grain may be fumigated more than once. In the Upper Midwest, several elevator managers told us that they sometimes use fumigants, not to kill insects, but rather to eliminate or hide odors from musty or sour grain or the presence of other objectionable foreign ingredients. These odors, if detected during the "sniff" tests conducted by Federal Grain Inspection Service (FGIS) or State inspection personnel, would result in the grain being downgraded or possibly even rejected. One fumigant producer advertises that its product can "help remove musty and ground odors," but a researcher at the U.S. Department of Agriculture's (USDA's) Grain

Marketing Research Laboratory in Manhattan, Kansas, disputed this claim.

OBJECTIVES, SCOPE, AND METHODOLOGY

We conducted this review to determine (1) how much grain fumigation was going on and why, (2) problems that were being experienced and the reasons for them, and (3) the extent and effectiveness of Federal Government involvement. We were interested in the subject of grain fumigation because of problems we learned of concerning unplacarded shipments of fumigated grain and the exposure of workers to potentially unsafe fumigant levels. Our interest stemmed from the impact these problems might have on future fumigant use, food supplies and prices, and the ease with which grain flows through the marketing system. Our interest stemmed also from the involvement of numerous Federal agencies in the grain fumigation area.

Our review was limited in the sense that we did not go into some of the issues in depth. Although we talked to people from numerous agencies and gathered considerable information, there were others who very likely could have given us additional insight had we pursued the subject further.

During the review we visited the Minneapolis/St. Paul area and the twin ports of Duluth, Minnesota, and Superior, Wisconsin; the New Orleans area; and Washington, D.C. In these areas we met with and obtained information from officials of EPA, Occupational Safety and Health Administration (OSHA), Food and Drug Administration (FDA), USDA, and the Coast Guard; State agencies in Louisiana, Minnesota, and Wisconsin; a number of grain companies and elevators; several labor unions; and several universities. We discussed grain fumigation with FGIS officials at several Texas ports and in Portland, Oregon. We also discussed grain fumigation and this report with surrogate members of the Interagency Regulatory Liaison Group (IRLG).

CHAPTER 2

GRAIN FUMIGATION PROBLEMS AND UNANSWERED QUESTIONS REMAIN

Although some 50 years have gone by since fumigation was first used as a means to eradicate insect pests from stored grain and grain products, fumigant-related problems and unanswered questions remain. Our work disclosed that:

--For a number of reasons, grain workers continue to be exposed to potentially unsafe fumigant levels.

--Concern about health as a result of fumigant exposure has touched off disputes and strained relations between some company and union officials.

--Fumigant residue has been found in some food products.

--A lack of knowledge exists concerning the effects of exposure to grain fumigants.

--Other fumigant-related issues affect the future and/or need resolution.

GRAIN WORKERS ARE EXPOSED TO HIGH FUMIGANT LEVELS

Anyone involved in fumigating grain or in coming in contact with the grain before the fumigant has totally dissipated runs the risk of exposure and any resulting health effects. Fumigants enter the body through the skin, the mouth, or through respiration. Although persons exposed to fumigants may be farmers, applicators, shippers, or workers at country, subterminal, or terminal elevators, those at terminal elevators seemed to be the hardest hit, or at least were the ones most vocal and for which there was the most discussion. Union officials told us that this is because workers at terminal elevators handle the largest amounts of grain, they are generally a little better educated, and that grain being received at the terminal elevator has a better chance of having been fumigated than it might at earlier stops along the grain marketing process.

OSHA has shown concern for the safety and health of grain workers. In February 1980, for example, OSHA published in the Federal Register a request for comments and information regarding the need for further regulation of occupational safety and health hazards found in grain-handling facilities. In addition, the notice announced a series of informal public meetings which were to permit oral presentations of additional data and information concerning these hazards. Ranked behind exposure to grain dust, OSHA labeled exposure to pesticides as the second major health

hazard found in grain-handling facilities and the cause of brain, liver, kidney, and lung damage, and even death, in grain-handling employees. OSHA was concerned that it had no specific standards protecting the 225,000 grain elevator workers and the additional 450,000 grain processing workers from the health hazards (including exposure to pesticides) particular to grain-handling facilities. OSHA was also concerned that although it had developed permissible exposure limits for some 160 substances which may be used as pesticides, these standards: (1) cover only a small percentage of the number of pesticides manufactured and formulated in this country, (2) only establish airborne concentration limits and general control requirements, and (3) do not address the other protective measures such as exposure monitoring, specific personal protective equipment, and medical surveillance.

In response to the OSHA request, comments from many different sources were received in writing and orally in the series of meetings held in April 1980 in Superior, Wisconsin; Kenner, Louisiana; and Kansas City, Missouri. Although seemingly so important at the time, because of staff reductions and other priorities, OSHA has not reviewed and analyzed the comments it received.

Our cursory review of the rather voluminous written comments OSHA received disclosed that they came from approximately 225 respondents. The comments, as requested, dealt with both safety and health aspects at grain-handling facilities. Comments relating to health were varied, but somewhat predictable. Smaller grain companies, for example, were fearful that they would be lumped together with larger companies and therefore be forced to comply with standards and requirements that would be burdensome to them. Larger companies complained that OSHA was overstating the health hazard problem; that the industry was already regulated closely enough, not only by OSHA, but also by EPA, FDA, and the Department of Transportation (DOT); and that no further regulations were needed. Other respondents, however, endorsed OSHA's involvement in this area; cited the harmful effects of improper or careless use of fumigants; and indicated a need for better fumigant testing, periodic physical examinations for employees, enforcement of rail placarding regulations, and the development of additional regulations and standards. These responses were primarily received from union officials and workers, academics, and government officials.

Oral comments OSHA received during its April 1980 meetings followed the same general patterns as those discussed above.

The comments OSHA received orally and in writing, plus additional work we performed, indicated the following as some of the reasons workers are unduly exposed to fumigants.

Shipments of fumigated grain are frequently not placarded

DOT regulations require that railcars be placarded with certain information if the grain being carried has been fumigated

after loading. There is no such requirement covering truck shipments because it is considered unlawful to fumigate grain once it is loaded onto the truck. The purpose of the placarding regulations is to alert grain workers of the presence of the fumigants so that they can knowingly take whatever actions are considered appropriate.

In years past, incoming grain to terminal elevators was often treated by shippers and truck drivers to avoid having the load "held up" at the elevator because of grain pests. Fumigant cannisters were often found lying on top of grain shipments or discarded at truck stops. Railcars also were received with heavy doses of fumigants. Many of the railcars and trucks were not placarded with warnings that their loads were treated and, as a result, unsuspecting grain samplers, inspectors, and other workers were exposed to harmful fumigant levels.

Although recently there has been some improvement in this area due to a greater awareness of the problem and heightened understanding between farmers, elevator operators, shippers, and grain workers, there are still considerable numbers of unplacarded shipments received at grain-handling facilities that contain unacceptable fumigant levels. In the twin ports area at Duluth, Minnesota and Superior, Wisconsin, for example, such shipments continue to concern grain workers even though they have won contract provisions requiring testing of all incoming shipments and the setting aside of shipments which exceed prescribed levels.

An FGIS safety inspector in Portland, Oregon, told us that Portland, likewise, was having a recurring problem of unplacarded railcar and truck shipments arriving with fumigated loads. He estimated that during the second quarter of fiscal year 1981, approximately 75 to 100 unplacarded railcars arrived with fumigated grain. He said that several inspectors had become sick from exposure to the fumigants, but none were hospitalized. He added that FGIS has been working with shippers and the Federal Railroad Administration, DOT, to resolve the problem, but that it has thus far been unsuccessful.

The problem of unplacarded shipments of fumigated grain is a tough one. Determining the cause of the fumigant residue is very difficult. Who treated the grain? When was it treated? Was the treatment properly done in terms of application rates, temperatures, and the time needed for aeration and dissipation before loading the grain into trucks and railcars? Was the treatment done illegally in transit in the case of trucks? In the case of railcars, was the treatment done in transit, but without prescribed placards having been used? Some shippers avoid the use of placards because they simply feel it calls undue attention to their loads and that they, therefore, face better prospects in getting their loads accepted without placards than they would otherwise. Shippers naturally want to avoid the considerable costs incurred in having their loads set aside for aeration purposes or returned to them.

Placarding regulations are difficult to enforce because of the above reasons. We were told that a shipper would have to be caught in the act of fumigating and shipping without placards before the Federal Railroad Administration could do much about it.

Improper fumigant applications

Workers may be exposed to higher fumigant levels than necessary if fumigants are not applied in accordance with label instructions which must be approved by EPA during its pesticide registration process. In the past, workers were frequently overexposed when liquid fumigants were simply "sloshed" onto the grain with 5-gallon buckets, or, when through carelessness, aluminum phosphide pellets reacted and gave off toxic fumes after being spilled on wet floors or exposed to warm, humid air. We were told that application procedures used by many companies have since become somewhat more sophisticated and that more care is now generally being exercised. We were also told by a couple of grain companies that they are now doing less fumigation "in-house" and that when they do fumigate, professional applicators are called in to do the job.

In a paper prepared in 1975 by a University of Wisconsin lecturer, it was stated that pesticide labeling was a problem in terms of application and that complete, standard, accurate labels were needed by all persons using grain fumigants. The paper discussed, among other things, the fact that recommended dosages sometimes varied for the same formulations and that each fumigant brand had different exposure times, temperatures for application, and recommended application procedures. A November 1980 letter to EPA continued this theme. Written by a Wisconsin State official, the letter stated that fumigant labels are often times not explicit enough in providing instructions for proper use. The letter did make reference to EPA's label improvement program, which is designed to correct a number of existing labeling problems.

EPA officials we talked to acknowledged the problems the agency has in enforcing proper pesticide applications. Regarding grain, they said that it was somewhat possible to keep track of fumigant application procedures at major grain elevators, but that it becomes impossible in overseeing fumigant applications by thousands of farmers and others who are authorized to fumigate.

Excessive dosages or applying fumigants at too low temperatures contribute to grain shipments being received at terminal facilities with fumigant levels that are too high. For example, fumigants applied in cold weather (below 45 degrees fahrenheit) will lie dormant in the grain mass and go undetected until warmer temperatures during shipment or unloading at the terminal facility cause the fumigants to begin to react and dissipate.

Need for more training, better equipment, and greater worker appreciation for fumigant hazards

Because of the toxic nature of fumigants, common sense dictates, among other things, that

--fumigants should only be used by authorized persons who have been trained in fumigant hazards and application techniques,

--all workers should receive safety training in the use and hazards of grain fumigants, and

--proper equipment and facilities should be provided to help protect those who apply or otherwise work around fumigants.

Although we did not spend much time in this area, we noted that workers were not always provided with adequate fumigant training and equipment and that, as a result, some workers were unnecessarily being exposed to fumigants. Because of a lack of training, it was also apparent that some workers were not aware of, nor did they fully appreciate, the hazards associated with grain fumigants. Some had risked and even lost their lives as a result.

Comments OSHA received in 1980 regarding health hazards in grain-handling facilities indicated a lack of training at numerous facilities and the fact that workers with little or no experience were sometimes given the job of applying grain fumigants. There were comments that discussed how workers were not informed of the dangers of the fumigants with which they were working, nor were they trained in the use of protective equipment that was available. In other cases, protective equipment was either not available or so cumbersome that workers refused to use it.

We were advised by a union official that very little safety and health training is being provided in the grain industry. She mentioned that during the past few years the union with which she is affiliated has sponsored safety and health seminars for, and given speeches to, approximately 900 grain workers. These workers, in turn, are expected to carry the messages back to their places of employment and to share them with other workers. Even so, she acknowledged that the number being so trained is but a small percentage of the total number of grain workers.

Grain inspectors, samplers, and other workers would be better protected from the hazards of grain fumigants if they were further removed from exposure through more automated procedures and the development and/or availability of necessary measurement devices and protective equipment. One recently completed terminal facility in the twin ports area is considered "state of the art" because of its automation and the fact that workers there have very little direct contact with the grain that flows through it.

One area where automation would be particularly helpful would be in the procedures grain inspectors presently use in performing what is known as their "sniff" test. To detect objectionable odors in grain, inspectors are required to put their faces close to the grain samples and to take a big "sniff." When the samples contain concentrations of fumigants, as they sometimes do, the inspectors are exposed to fumigant levels far in excess of those considered safe. The procedure as it is now done has been described by a union official and document as deplorable and antiquated and that it represents perhaps the most incredibly hazardous exposure to pesticides. In June 1980 there was talk of the possibility of some research being done through USDA's Science and Education Administration to automate "sniff" test procedures.

STRAINED RELATIONS BETWEEN COMPANY AND UNION OFFICIALS

The fumigant issue is an emotionally charged one. Company and union officials see the issue from widely differing perspectives, and it is these differences that have created some problems in years past and are straining relations even now. The issue was a matter of negotiations between labor and management in the twin ports area in 1979. Resulting from these negotiations were certain contract provisions having to do with the testing of incoming shipments and right of refusal by the union to handle treated shipments. At present, company and union officials continue to feel quite differently towards the fumigant issue.

On the one hand, company officials we talked to in the Minneapolis/St. Paul and twin ports areas pointed to improvements and procedural changes recently made to better protect workers. They indicated that the number of fumigant-treated grain shipments are small in relation to all shipments, and one official characterized any problems that now exist as merely nuisances. Company officials believe that union representatives are overdramatizing and sensationalizing the entire situation.

On the other hand, union officials at both national and local levels believe that workers continue to be threatened through unnecessary exposure to grain fumigants. The Food and Beverage Trades Department, AFL-CIO--representing 13 unions in the food and allied service trades, including the 30,000 member American Federation of Grain Millers--has maintained an active interest in the hazards posed by exposure to pesticides. The trades department, as well as the American Federation of Grain Millers, took an active part in the OSHA-held hearings in 1980 regarding safety and health in grain-handling facilities. The trades department has also corresponded recently with EPA advocating a ban on the use of carbon tetrachloride in pesticides and outlining the hazards this chemical presents to grain workers. Files of the trades department are filled with incidents relating to workers exposed to fumigants. Union officials said that laws

relating to fumigant applications, placarding, and worker health continue to be broken and that there is little Federal enforcement of these laws. Union officials said that if grain workers are to be adequately protected, more definitive standards and procedures need to be devised covering the testing, sampling, and handling of fumigated grain.

The union's refusal to handle treated shipments in the twin ports area has also created some strained relations between it and farmers, elevator operators, and shippers from the Dakotas and Minnesota. Any time treated grain is set aside for aeration or is returned to whomever shipped it, additional costs are incurred in detaining the shipment or for return transportation charges. This becomes particularly irritating to the farmer, elevator operator, or shipper who claims it was not he or she who treated the grain. Some grain shipments have purposely been routed to other shipment points to avoid the fumigant issue, which has seemed so significant in the twin ports area.

FUMIGANT RESIDUE FOUND IN FOOD PRODUCTS

Grain fumigants were originally thought to dissipate over time, given sufficient grain ventilation and temperature. Although ethylene dibromide is a chemical which has been used to fumigate stored grains on farms and in country elevators since the 1950's, EPA research in the past several years has established that (1) the chemical causes cancer, heritable genetic damage, and reproductive disorders and (2) the chemical's residue is being found in some finished bakery products.

According to the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), as amended, EPA is responsible for reviewing the risks and benefits of the uses of pesticides suspected of causing adverse effects to human health or the environment. Under the process that has been established for doing this, EPA has had ethylene dibromide under consideration since December 1977. Since then EPA has reviewed comments it has received regarding the chemical's use and has conducted risk and benefit analyses. At the time of our work EPA was proposing that certain uses of ethylene dibromide (including the fumigation of stored grains and spot fumigation of grain milling machinery) be banned. EPA believes that the public health risks from certain ethylene dibromide uses outweigh any economic benefits.

The FIFRA Scientific Advisory Panel, in an April 1981 memorandum to EPA's Deputy Assistant Administrator for Pesticide Programs, expressed its great concern over the possible presence of ethylene dibromide residue in finished bakery products. The panel stated that:

> "The evidence is far from solid, but because of the extremely large population potentially at risk, the problem demands resolution. Therefore, the panel

concurs with the EPA proposal to cancel stored grain fumigation and spot fumigation of grain milling machinery uses until such time as convincing evidence exists that such uses present little or no hazard to consumers of bakery products."

LACK OF KNOWLEDGE CONCERNING GRAIN FUMIGANTS AND THEIR EFFECTS

There is still much to learn about various fumigants and the effects of human exposure to them. Such knowledge would serve to either reduce current unwarranted anxiety levels or provide documented support for stronger, future precautionary measures. The preceding section discussed ethylene dibromide as a fumigant which has been used for about 30 years, but for which information is still needed. Carbon tetrachloride is another chemical, popular in many fumigant products, which is currently undergoing EPA study. Carbon tetrachloride-based fumigants have likewise been used for many years for fumigating stored grains, but now EPA is showing serious concern that products containing the chemical may exceed the criteria for risk associated with oncogencity, mutagenity, and other chronic effects. Consequently, EPA is presently seeking comments and performing analyses in much the same fashion as it did for ethylene dibromide.

Interestingly, the use of carbon tetrachloride was banned in Canada over 6 years ago. In this country, it has been criticized by union officials as the cause or suspected cause of cirrhosis and other liver damage, kidney damage, and cancer in both animals and humans. The union has stated that many grain millers are exposed to hazardous concentrations of the chemical and that carbon tetrachloride residue has shown up in bread and other food products.

Carbon tetrachloride-based fumigants have proven popular in the grain industry, and officials of grain companies we talked to indicated that banning their use by EPA would create some problems because few substitutes are available. EPA has stated that carbon tetrachloride formulations provide the grain storage industry with a convenient liquid fumigant, absorbed readily by grain, and adapted to most types of storage facilities. In spite of EPA's concern for the health risks associated with the use of carbon tetrachloride-based fumigants, EPA has stated that such fumigants are "* * *potentially less harmful and easier to use than most alternative fumigants." This dichotomy raises questions about how safe any of the fumigants are and exactly how much is known about each.

Immediate effects on humans from exposure to grain fumigants appear to be well known and documented. Symptoms include dizziness, nausea, stomach cramps, headaches, blackouts, disorientation, and even death. Longer term effects from repeated low-level exposure to fumigated grain are not so well known, the cause

of concern, and the subject of at least one study that was just getting underway.

An FGIS safety officer, for example, expressed concern to us over the potential long-term health effects of fumigant exposure on grain samplers and inspectors. He mentioned the "sniff" test as being hazardous and the fact that no one has studied its long-term effects. He also told us of one grain sampler whose liver ailment was traced to the exposure from chemically treated grain he received while working 25 years in the grain industry.

Grain inspectors for the Minnesota Department of Agriculture complained about the exposure to chemicals they are faced with in their work. The "sniff" test was again mentioned as a procedure during which they were often exposed. In commenting on worker sickness which often results from such exposure, a representative from the inspectors' union said, "This is something that happens all the time, and no one knows what the cumulative effects of those fumigants are."

Unions point to workers who have become ill, have been forced to retire early because of permanent disablement, or died as evidences of the effects of exposure to fumigants. Although we do not know the outcomes, some former union workers or their survivors have sued grain companies for damages they have sustained. As discussed earlier, union representatives did make their feelings known during the meetings OSHA held in 1980, and coming from those meetings was the conclusion that grain worker exposure to pesticides and fumigants needs to be more fully studied.

At the time of our work, one research effort was about to begin which would measure the extent and effects of fumigant exposure on Minnesota grain samplers and inspectors. The project is to run for 12 months and is to be jointly funded through USDA's Pesticide Impact Assessment Program, the State of Minnesota, and OSHA. It is to be conducted by researchers at the University of Minnesota. Objectives of the research will be to: (1) document the frequency, circumstances, and concentrations with which grain samplers and inspectors are exposed to fumigants (particularly carbon tetrachloride), (2) compare the exposure levels to existing standards, and (3) determine through case histories the degree of correlation between employee health problems and classical signs of fumigant exposure.

Minnesota samplers and inspectors are concerned about the present lack of knowledge regarding fumigant exposure and feel the research will tell them if and how they are being threatened. The American Federation of Grain Millers was somewhat concerned that the research centers strictly on the activities of State samplers and inspectors and that it does not relate more directly

to what they do. The union did feel, however, that the research would provide some answers.

ADDITIONAL FUMIGANT-RELATED ISSUES AFFECTING THE FUTURE AND/OR NEEDING RESOLUTION

The preceding sections touched on some of the current problems and needs regarding grain fumigation. Following are some additional issues which will have an impact in the future and require consideration and, perhaps, resolution.

--USDA's Grain Marketing Research Laboratory recently found that heavy infestations of damaging insects were threatening the quality and value of millions of bushels of farmer-held grain stored under the Federal Government's grain reserve program. The laboratory's survey found that very little grain stored under the program had been treated to repel insects. It was also found that the farmers, who were responsible for their grain's quality, generally were not equipped to care for it properly.

--Future demand for grain is expected to continue its upward trend.

--Some insects are developing resistances to grain protectants and fumigants and are becoming a serious problem in farm and commercial grain storage.

--Gauges and methods used in measuring fumigant tolerance levels are much more sophisticated and precise now than they once were. EPA officials expressed their concern to us that some levels set a number of years ago may be too high.

--Irradiation is being discussed as a possible alternative to fumigation in controlling pests in grain.

--Agricultural pesticides, measured and applied by the bagful in the 1940's and 1950's and by the pound in the 1960's and 1970's, will undergo a metamorphosis during the 1980's. Application quantities will be measured in teaspoons and ounces, and there is hope that new pesticide technology will result in pesticides that are safer, environmentally acceptable, and effective in controlling pests.

CHAPTER 3

NEED FOR INTEGRATED APPROACH TO SOLVE GRAIN FUMIGANT PROBLEMS

One of the things we noted during our work was the many different entities involved in various aspects of grain fumigation. Many of these entities were governmental including both Federal and State, while others were private organizations. With particular regard to the involvement of Federal departments and agencies, the approach toward the subject of grain fumigation seemed rather fragmented, although we noted some interactions. The problems that continue to exist after many years of fumigating grain, however, impede somewhat the efficiency with which grain in this country is moved and indicate a need for a more integrated, coordinated approach to solving many of these problems. IRLG was suggested by several sources as an entity capable of effecting and overseeing such an approach. This group, formed in 1977 by the heads of four agencies--Consumer Product Safety Commission, EPA, FDA, and OSHA 1/--to enable the agencies to work closely together in areas of common interest and responsibility, appears to us be a proper forum which could effect and oversee such an approach.

NUMEROUS FEDERAL AGENCIES INVOLVED IN GRAIN FUMIGATION

During our work we met with and/or obtained information from departments and agencies including USDA, EPA, OSHA, DOT, and FDA. At USDA and EPA we talked with officials from a number of different organizational units within each agency. From the information we obtained, it was apparent that many entities are involved in the subject of grain fumigation. Each appears to have a role to play, and we did note instances where two or more entities were working together in the discharge of their responsibilities. For example, we were told in New Orleans of an interagency agreement between FGIS and USDA's Animal and Plant Health Inspection Service in which the two work closely, without duplication, in inspecting grain and identifying any insects that may be found. We also obtained copies of memorandums between USDA and EPA which formalized certain working relationships in conducting pesticide benefit/risk assessments. Other documentation we obtained showed other interactions between officials of different agencies working together to solve day-to-day fumigant-related problems.

In spite of the interaction and cooperative efforts that were taking place, more needs to be done. Officials from EPA

1/ USDA's Food Safety and Inspection Service (formerly Food Safety and Quality Service) joined the group later.

told us, for example, of the need for greater coordination among the various Federal agencies. We were advised that each agency was doing its own thing without sufficient interagency contact or coordination and without any one agency having a good overview of all that was taking place. We were advised that there may be some duplication and that there are unclear lines of responsibility. We were further advised that a need exists for the different agencies to get together through some kind of forum and begin to look at fumigation from an integrated, coordinated approach.

Even within a given agency there may be a need for more coordination. EPA, for example, was admonished in a February 27, 1981, letter it received from a consulting firm "* * *to consolidate the present interrelated but uncoordinated regulatory, and proposed regulatory, actions with regard to pesticides used in the management of stored grains." The letter further stated that "The use of pesticides in the management of stored grain pests depends on a integrated approach."

In an April 13, 1981, response, EPA stated that it has initiated a project in which a systematic approach to grain fumigants (recognizing the interrelationships between the various chemicals) will be developed. The response further stated that "Our work will be coordinated with other Federal agencies including the U.S. Department of Agriculture, the Food and Drug Administration, and the Occupational Safety and Health Administration."

IRLG SUGGESTED AS AN ENTITY TO OVERSEE GRAIN FUMIGANT PROBLEMS

Our work disclosed several instances in which IRLG was considered by various parties to be the appropriate forum to consider certain fumigant-related problems. For example, on July 25, 1980, the Director of USDA's Office of Safety and Health Management wrote to the IRLG/Food Safety and Quality Service representative that:

> "Our concern is for the allegedly inappropriate use of fumigants in the Duluth-Superior export elevators. The use of fumigants and the handling of grain is a multiagency jurisdiction problem; therefore, this memorandum is being forwarded through you to the Interagency Regulatory Liaison Group (IRLG) in order that they can be made aware of our concern and respond accordingly."

In another instance, in November 1980 an official from the State of Wisconsin wrote to EPA concerning the circumstances of fumigant exposure in the twin ports area. The letter provided some historical background indicating some improvements, but it stated that "* * *there are still a significant number of shipments that come in that contain unacceptable levels of fumigant

in the grain." After discussing the responsibilities of and actions taken by OSHA, DOT, EPA, the States of Wisconsin, Minnesota, North and South Dakota, the grain handlers union, and the North Dakota Grain Dealers Association in this matter, the letter indicated that it had been deemed appropriate to see if IRLG might be able to aid in the speedy resolution of the problem. The letter stated that:

> "The interagency authorities in this situation do not aid the quick resolution or apparently allow for an easy solution. Perhaps what is needed currently is more discourse between officials in IRLG, the agencies per se and the state people in order to uncomplicate the circumstances."
>
> * * * * *
>
> "It was and is my hope that IRLG may be able to aid in sorting out whose authority is what and how to efficiently and effectively deal with the situation * * *."

CONCLUSIONS

Grain fumigation is a broad subject which affects the efficiency with which grain moves through the marketing system and involves environmental, consumer and worker protection, transportation, and food considerations. Despite many years of using fumigants as a means to eradicate insect pests from grain and grain products, and despite the involvement of numerous government agencies in various facets of this activity, fumigant-related problems continue to exist and much still needs to be learned if fumigants are to be used as efficiently, effectively, and safely as possible.

Currently, many Federal agencies are involved with grain fumigation in some way. Although we believe each of the agencies has a role to play and although we noted interactions among them, the Federal approach to the subject is fragmented and a need exists for more integration and coordination. We believe that IRLG is a proper forum that could bring the various agencies together and that it could provide the needed overseer role. It could help reduce any overlap or duplication that may now exist by objectively defining lines of responsibility. It could help ensure that the efforts of one agency complement the efforts of other agencies. It could establish subgroups to study various facets of the fumigant issue, drawing upon, and combining, the unique talents and expertise that exist in the various agencies to solve the problems at hand or to obtain needed information.

RECOMMENDATIONS

We recommend that IRLG accept grain fumigation as a topic for its consideration. We recommend that the group assume the role of overseer of the fumigation area and that it publicize

this role to its participating agencies and others. We further recommend that the group address the problems discussed in this report and any related issues. Initially, the group may want to deal only with problems and issues faced by its member agencies. But thereafter the group could look for ways to involve other agencies that are not now a part of the group, but which do deal with some facet of grain fumigation.

(097480)